

and this was again modified in 1909. Certain statistical information given is, too, of doubtful correctness. Names are frequently misspelt. But putting aside minor blemishes of this kind the work is of a decidedly useful nature, and, like the inorganic portion, to be commended. It may be noted that a German translation of the whole work is in progress, so that it may shortly become more accessible to the English student.

W. A. D.

OUR BOOK SHELF.

Guide to the Crustacea, Arachnida, Onychophora, and Myriopoda exhibited in the Department of Zoology, British Museum (Natural History). Pp. 133; 90 illustrations. (London : Printed by order of the Trustees of the British Museum, 1910.) Price 1s.

THIS "Guide" admirably fulfils its functions; it is written in a clear style, and indicates tersely the main points of interest associated with the chief families and genera. The principal characters of each subdivision—class, order, tribe, family—are concisely stated, and those of its members are selected for mention which most aptly illustrate points in morphology or distribution, or show some striking habit. The section on the Crustacea opens with a short account of the lobster, its external features and appendages, internal organs, development, moulting, and the asymmetry of its chelæ. Short notes are added on the modifications caused by parasites and on adaptations to environment.

The systematic account of the Crustacea, in addition to stating the characters of each subdivision, contains a large number of interesting references to morphological and distributional points which make it valuable apart from the special purpose for which it was prepared. To give two instances—(1) the formation of a respiratory siphon which takes place in the Albuneidæ by apposition of the antennules, but in Corystes by association of the antennæ; and (2) the appearance of Apus in Scotland in 1907, which is ascribed to the introduction of the eggs, perhaps on the feet of birds, from the Continent. The Arachnida, including Limulus and the Eurypterines, and the Myriopoda are dealt with in a similarly interesting manner, and short notes are added on the Trilobita, Pycnognida, Pentastomida, and Onychophora. A little more space might well have been devoted to the Ixodidæ, in view of their great importance in connection with the spread of disease in man and animals. The illustrations, many of which are new and are prepared from photographs of the specimens exhibited, are excellent, and well support the text.

Popular Astronomy. By the late Prof. Simon Newcomb. Pp. xx+580+5 star maps. (London : Macmillan and Co., Ltd., 1910.) Price 8s. 6d. net.

ASTRONOMY has no doubt made progress in several directions since the late Prof. Newcomb revised his renowned work; nevertheless, if the lamented author were alive to re-write his book at the present time, by far the greater part could not be improved upon. The extensions of knowledge take place at the frontiers of a science, while the main body of fact and principle remains unaltered. While, therefore, this cheap edition of Prof. Newcomb's "Popular Astronomy" is issued without additions referring to recent developments, the volume can fairly be described as one of the most lucid and authoritative statements of the foundations of astronomical science available even

now. To let such a work pass out of print would have been a misfortune, and we trust that the issue of an edition at less than half the original price will be the means of making many new readers familiar with its merits.

Naturwissenschaftliches Unterrichtswerk für höhere Mädchenschulen. Teil iv., Lehrstoff der iv. Klasse. By Dr. K. Smalian and K. Bermau. Pp. 152. (Leipzig : G. Freytag, 1910.) Price 2.50 marks.

THIS volume, one of a series graded for successive school classes, has been prepared to comply with official regulations, wherein presumably lies the reason for combining a triad admixture of botany, zoology, and mineralogy. The aim of the authors has been directed less towards a training manual and more towards providing a compendium of information on objects which are met with in daily life. The book contains an accurate but condensed collation of facts concerning cryptogamic and economic botany, the zoological groups of mollusca, vermes, and coelenterata, and common or useful minerals. It is plentifully illustrated with good text-figures and a dozen coloured plates.

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

Pwdr Ser.

In my former communication on this subject I gave all the information I had been able to collect respecting the popular belief as to the masses of white jelly found in my experience on mountain pastures, but, according to the observations of others, on different kinds of ground and at various seasons.

I recently procured a specimen of the jelly, and quoted a letter from Mr. Arber, to whom I had sent it, giving the opinion of Mr. Brookes, to whom Mr. Arber had referred it. After that was written I received the following note from Mr. Brookes, under the date April 4:—"The 'jelly' had been gathered several days before it reached me, and hence its condition was not suitable for examination, several putrefactive organisms having begun to flourish upon the jelly in the meantime. The remains of the substance which I saw seemed to be most like the zoogloea stage of some bacterial organism or the plasmodium of a myxomycete. The 'jelly' itself had no cellular structure. There was no nostoc present or any allied organism."

More recently I received a specimen which Mr. Burnett, headmaster of the Grammar School at Kirkby Lonsdale, found in the Rawthay Valley, some miles above Sedbergh. This also I sent to Mr. Brookes, who writes (July 26) that "the jelly-like mass sent from Kirkby Lonsdale is undoubtedly the plasmodium of a myxocete," and adds that he is "keeping it to see whether it will give rise to spores."

Mr. Worthington Smith, in a letter dated June 24, says:—"Perhaps you will find the substance so accurately described by you in this week's NATURE under the generic name of Zoogloea; the name as a genus may be obsolete now, but I think that in past times it was placed amongst the algae, perhaps near Nostoc, and afterwards included in the Schizomyctes. However this may be, I know the substance very well, and I have often had it sent on to me in the past (when I used to answer correspondents for some of the horticultural papers) as a fungus—a Tremella—difficult to trace. I have heard it, as well as Nostoc, associated with fallen stars amongst rustics."

These authorities, as well as Miss Fry (NATURE, June 30),

agree as to the nature of the Pwdre Ser, and I must say that whenever I have observed its manner of occurrence it has seemed to me to grow out of the sod—but I would not like to say that what I have seen has always been the same kind of matter.

The very circumstantial account given by Morton, that something of the kind is disgorged by birds, is confirmed by other later observers.

Although we must not too hastily accept what is undoubtedly a *vera causa* as the only explanation, we may feel that we are moving in the right direction to find the answer to the question, What is it?

The question why it is associated with falling stars has received a plausible explanation from Messrs. Grove and Griffiths (NATURE, July 21); but falling stars do not appear to hit the ground so that an observer can walk up to the spot where they seem to have fallen, as in the case of lightning or thunderbolts, and if we bring in possibilities of other luminous bodies we raise the difficult question of lambent fires, &c. The star-like radiating form of the jelly-fish, like that of the star-fish, is sufficient to explain the name given by Admiral Smyth (July 21, p. 73).

While our botanical friends are finding out for us what it is, may I hope that some of our literary friends will trace the belief back further than the sixteenth century, when we find it accepted as if founded upon well-known facts?

T. MCKENNY HUGHES.

July 29.

The Blood sucking Conorrhinus.

It may interest readers of NATURE to be informed that the great South American bug figured on p. 142 of the issue of August 4 punished Charles Darwin when travelling in the Pampas, happily without infecting him with its trypanosome (see "Journal of a Naturalist," ed. 1845 p. 330). J. D. H.

The Camp, near Sunningdale, August 5.

[SUBJOINED is the description to which our correspondent refers.—ED. NATURE.]

"WE slept in the village of Luxan, which is a small place surrounded by gardens, and forms the most southern cultivated district in the Province of Mendoza; it is five leagues south of the capital. At night I experienced an attack (for it deserves no less a name) of the *Benchuca*, a species of *Reduvius*, the great black bug of the Pampas. It is most disgusting to feel soft, wingless insects about an inch long crawling over one's body. Before sucking they are quite thin, but afterwards they become round and bloated with blood, and in this state are easily crushed. One which I caught at Iquique (for they are found in Chile and Peru) was very empty. When placed on a table, and though surrounded by people, if a finger was presented the bold insect would immediately protrude its sucker, make a charge, and, if allowed, draw blood. No pain was caused by the wound. It was curious to watch its body during the act of sucking, as in less than ten minutes it changed from being as flat as a wafer to a globular form. This one feast, for which the benchuca was indebted to one of the officers, kept it fat during four whole months; but, after the first fortnight, it was quite ready to have another suck."

The Early History of Non-Euclidean Geometry.

In a recent number of NATURE (June 30) there appeared a review of a book by G. Mannoury on the philosophy of mathematics, and the reviewer emphasised a statement of the author to the effect that the claim for Gauss that he was the first to assert the possibility of a non-Euclidean geometry is threatened by F. K. Schweikart, who in December, 1818, sent a note to Gauss asserting the existence of a geometry in which the sum of the angles of a triangle is less than two right angles. The facts about Schweikart were made known fifteen years ago by Stäckel and Engel ("Theorie der Parallellinien," p. 243), and the actual documents were published in Gauss's "Werke," Bd. viii. (1900). It must be admitted that Schweikart

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arrived independently at this result, though it is not so obvious that he had forestalled the "giant mathematician." Schweikart states his hypothesis very clearly, and explains that Euclidean geometry is a special case of a more general geometry. On the other hand, Gauss was interested in the theory of parallels from at least 1799; and some time between 1808 and 1816 he arrived at the belief that non-Euclidean geometry was possibly true, for in 1808 he asserted that the idea of an *a priori* linear constant (the "space-constant") was absurd, while in 1816 he declared that, while seemingly paradoxical, this idea was in no way self-contradictory, and that Euclid's geometry might not be the true one. In his comments on Schweikart's note, he exhibits quite an extensive knowledge of non-Euclidean trigonometry.

Of course, the development of non-Euclidean geometry and trigonometry is due independently to Lobachevskij (1829), and Bolyai (1832), and even that was worked out to a large extent previously by Lambert (1786), and still earlier by the Italian Jesuit Saccheri (1733), though neither of these two conceived for a moment the possibility of non-Euclidean geometry being true.

It is interesting in this connection to recall the hesitancy of Cayley to accept non-Euclidean geometry, although he himself practically inaugurated a new epoch. He never seemed quite to appreciate the subject, and on one occasion, at least, fell into a mistake in writing about it. In his article "On the Non-Euclidean Plane Geometry," Math. Papers, vol. xiii., p. 237, he inadvertently takes the equatorial circle of the pseudosphere (the surface of revolution of the tractrix) as representing the points at infinity, whereas the absolute is only represented by a single point, viz. the point at infinity on the pseudosphere.

D. M. Y. SOMMERRILLE.

The University, St. Andrews, July 26.

The Total Solar Eclipse of April 28, 1911.

WHILST astronomers who intend to observe this eclipse are choosing from amongst the Vavau, Tau, Nassau, and Danger Islands, the best one on which to land, it may be useful to state the totalities of the eclipse in these islands.

From the calculation of the phases obtained by the Besselian method, and with the data of the "American Ephemeris," I have found the following values:

	m. s.
Vavau (arch. of Tonga)	Totality = 3 36'6
Tau (arch. of Samoa)	" = 2 13'0
Danger (arch. of Union)	" = 3 19'4
Nassau (")	" = 4 9'9

The geographical coordinates of these islands, adopted in the calculations, are respectively:—

Islands	λ	ϕ
Vavau	-173 59'0	... -18 39'0
Tau	-169 32'0	... -14 13'5
Danger	-165 45'0	... -10 53'0
Nassau	-165 25'0	... -11 33'0

Rome, July 29.

PIO EMANUELLI.

Mars in 1909 as seen at the Lowell Observatory.

The accompanying prints are photographs of the globe of Mars, representing the details seen on the planet at the Lowell Observatory at the last opposition in 1909.

These maps demonstrate strikingly the development of the canals from the melting cap, shown by the number of canals visible in the southern hemisphere at the time, especially about the south pole, and by the absence of canals in the northern one, notably in the neighbourhood of the north polar cap.

The canals numbered 659 or 660 are the two great new canals, of which the account has already been published, and of which the size enabled the advent to be established with certainty. Several other examples of fresh origination are to be seen on the charts, about which the evidence is hardly less conclusive.

The white patches at some distance from the south pole